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EXAMINER
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CANTELMO, GREGG

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/019,488

Applicant(s)

BENCZUR-UERMOESSY, GABOR

Examiner

Gregg Cantelmo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 14-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-16 and 18-31 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Response to Amendment***

1. In response to the amendment received on July 12, 2004:
  - a. Claims 14-31 are pending;
  - b. The claim objection presented in the previous office action is withdrawn in light of the amendment to claim 23;
  - c. The 112 rejections presented in the previous office action are withdrawn in light of the amendment to claims 18 and 25;
  - d. The prior art rejections of record are withdrawn in light of the amendment.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
3. Claim 30 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The negative limitation of "wherein none of the electrodes are auxiliary electrodes" is not supported by the original disclosure and one

of ordinary skill in the art would not have appreciated that such an arrangement based on the original written description.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 14-16 and 30-31 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 4,115,630 (van Ommering).

van Ommering discloses a gastight cell in Fig. 2, 4 and 5 comprising: at least one positive nickel oxide electrode 74 (claim 2 and Figs. 4 and 5), at least one hydrogen-storing negative electrode 70 and 78 (col. 5, ll. 43-61 and Figs. 4 and 5) and a hydrophilic separator 76 disposed between the electrodes (paragraph bridging columns 5 and 6) and an alkaline electrolyte (col. 5, line 16) wherein the negative electrodes are provided with a TEFLON hydrophobic backing surface (34 in Fig. 1 or 80 in Figs. 4 and 5 for transporting gases of the cell atmosphere (col. 5, ll. 43-61 and col. 8, ll. 17-18) and wherein all of the negative electrodes are hydrogen electrodes (col. 5, ll. 3-8 as applied to claim 14).

The assembly includes alternating negative and positive electrode layers as shown in Fig. 4 with the stack beginning and ending with negative electrodes. Thus the

Art Unit: 1745

number of negative electrodes is one more ( $n+1$ ) than the positive electrodes ( $n$ ), (Fig. 4 as applied to claim 15).

The negative electrodes comprise split electrodes between positive electrodes 84, 86 and 88 and unsplit end electrodes adjacent to plates 64 and 66. The split electrodes are separated by the hydrophobic gas-permeable element 80 (Fig. 4 as applied to claim 16).

van Ommering discloses a gastight cell in Fig. 2, 4 and 5 comprising: at least one positive nickel oxide electrode 74 (claim 2 and Figs. 4 and 5), at least one hydrogen-storing negative electrode 70 and 78 (col. 5, ll. 43-61 and Figs. 4 and 5) and a hydrophilic separator 76 disposed between the electrodes (paragraph bridging columns 5 and 6) and an alkaline electrolyte (col. 5, line 16) wherein the negative electrodes are provided with a TEFLON hydrophobic backing surface (34 in Fig. 1 or 80 in Figs. 4 and 5 for transporting gases of the cell atmosphere (col. 5, ll. 43-61 and col. 8, ll. 17-18) and wherein all of the negative electrodes are hydrogen electrodes. None of the electrodes are disclosed as auxiliary electrodes (col. 5, ll. 3-8 as applied to claim 30).

van Ommering discloses a gastight cell in Fig. 2, 4 and 5 comprising: a plurality of electrodes consisting essentially of one or more positive nickel oxide electrode 74 (claim 2 and Figs. 4 and 5), one or more hydrogen-storing negative electrode 70 and 78 (col. 5, ll. 43-61 and Figs. 4 and 5) a hydrophilic separator 76 disposed between the electrodes (paragraph bridging columns 5 and 6) and an alkaline electrolyte (col. 5, line 16) wherein the negative electrodes are provided with a TEFLON hydrophobic backing surface (34 in Fig. 1 or 80 in Figs. 4 and 5 for transporting gases of the cell atmosphere

Art Unit: 1745

(col. 5, ll. 43-61 and col. 8, ll. 17-18) and wherein all of the negative electrodes are hydrogen electrodes (col. 5, ll. 3-8 as applied to claim 31).

### ***Response to Arguments***

6. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Ommering in view of U.S. patent No. 6,103,424 (Hamamatsu).

The teachings of claim 14, with respect to van Ommering, have been discussed above and are incorporated herein.

The difference is of the two parts of the split negative electrodes having half the thickness or half the capacitance of an unsplit negative electrode.

With respect to claim 18:

The reference unsplit electrode is unspecified and additionally not a positive feature of the structural battery of claim 18. It is unclear how this feature is defined relative to the particulars of the claimed electrochemical cell, especially since the cell

Art Unit: 1745

does not require or define an unsplit electrode, and even further to the thickness or capacitance of the unsplit electrode.

The prior art teaches of a structurally split electrode and it is held that the thickness of the electrodes 4' will be inherently if not obviously half the thickness and/or half the capacitance to any other known electrode having different dimensions and/or capacitance.

At best it would appear that the frame of reference for the unsplit electrode is to one which is twice the thickness or capacitance as the half electrodes and one of ordinary skill in the art would have found it obvious to proportionally dimension the thickness of each half electrode or to reduce the capacitance of the half electrode to be half that of the unsplit electrode since the combined total thickness or capacitance of both adjacent split electrodes would be equivalent to the thickness or capacitance of an unsplit electrode. This maintains the relative capacitance between the sum of the positive and negative electrodes in the entire stack of the cells.

Hamamatsu discloses that the thickness of each half of a split electrode 73 is  $\frac{1}{2}$  the thickness of the unsplit electrode 73. Thus the total thickness of each electrode whether split or unsplit are equal.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of providing the electrodes 4' of van Ommering to be half the thickness or half the capacitance relative to an unsplit electrode since if the combined thickness or capacitance of each half of the split electrode relative to the thickness or capacitance of the unsplit electrode would have

Art Unit: 1745

been the same and thus this would have maintained the relative capacitance between the sum positive electrodes and sum negative electrodes within the entire stack of the cells.

9. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Ommering in view of JP 60-250567-A (JP '567).

The teachings of claim 14, with respect to van Ommering, have been discussed above and are incorporated herein.

The differences not yet discussed are of the particulars of the transport element of van Ommering being a nonwoven layer (claim 19), a nonwoven polypropylene layer (claims 20).

As discussed above van Ommering discloses providing a hydrophobic polypropylene spacer 80.

JP '567 discloses that it is desirable to dispose a hydrophobic (water-repellant) nonwoven polypropylene fabric to the negative electrode to provide a layer which is both hydrophobic and gas permeable. This material provides a layer for oxygen gas absorption at the negative electrode (abstract).

The motivation for using a nonwoven polypropylene material as disclosed by JP '567 is that it provides a layer which is both hydrophobic and gas permeable. This material provides a layer for oxygen gas absorption at the negative electrode.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of van Ommering by providing the polypropylene material to be a nonwoven material as taught by JP '567 since it



Art Unit: 1745

would have provided a layer which is both hydrophobic and gas permeable and provided a layer for oxygen gas absorption at the negative electrode.

10. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Ommering in view of Sonoda.

The teachings of claim 14, with respect to van Ommering, have been discussed above and are incorporated herein.

The difference between claim 21 and van Ommering is of the positive electrode comprising fibrous-structure frameworks.

The substrate supporting an active material of the positive electrode of these alkaline storage batteries include nickel porous substrates, e.g., a sintered nickel substrate, a foamed nickel substrate, and a fibrous nickel substrate. An increased energy density can be obtained by increasing the porosity of these substrates to which an active material is applied (Sonoda, col. 3, ll. 44-51).

The motivation for providing the fibrous-structure frameworks for the positive electrodes is that it provides a positive electrode arrangement having increased energy density due to the increased porosity of the fibrous substrate.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of van Ommering by using a fibrous-structure frameworks for the positive electrodes since it would have provided a positive electrode arrangement having increased energy density due to the increased porosity of the fibrous substrate.

Art Unit: 1745

11. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Ommering in view of JP 07-235304-A (JP '304) or U.S. Patent No. 5,059,496 (Sindorf).

The teachings of claim 14, with respect to van Ommering, have been discussed above and are incorporated herein.

The difference between claim 22 and van Ommering is of the separator material being a hydrophilic nonwoven polypropylene fiber.

JP '304 discloses using hydrophilic nonwoven polyamide or polypropylene fibers as separator materials in batteries (abstract).

Sindorf discloses a similar separator. While many absorbent materials will function adequately as an absorber, the selected material must necessarily be nondegradable in the electrolyte and resistant to oxygen. Additionally, the selected material must have a capillary potential substantially sufficient to hold electrolyte, yet lower than that of the positive electrodes and separator, so that the absorber material does not draw, but instead supplies, electrolyte to the surface 32 of the positive electrode. Absorber 18 may, for example, be a non-woven polypropylene suitably treated to be hydrophilic. A non-woven plastic fiber appears to be a cost-effective choice (col. 10, ll. 53-64).

The motivation for using a hydrophilic nonwoven polyamide or polypropylene fiber mat separator is that it provides a separator having an effective electrical barrier between the opposite electrodes while having sufficient electrolyte absorption and ionic conductivity.

Art Unit: 1745

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of van Ommering by selecting the separator to be a hydrophilic nonwoven polyamide or polypropylene fiber mat separator since it would have provided a separator having an effective electrical barrier between the opposite electrodes while having had sufficient electrolyte absorption and ionic conductivity. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

12. Claims 23 and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Ommering applied to claim 14 above, and further in view of EP 419220 A (EP '220)

The differences not yet discussed are of the particulars of the negative electrode.

With respect to claim 23:

EP '220 discloses of a negative electrode comprising a current collector (i.e. a metallic substrate) on which an active material is disposed. The active material comprising an alloy for hydrogen storage (abstract), an amorphous carbon material such as acetylene black, carbon black or the like (one of ordinary skill in the art recognizing that soot is another amorphous carbon material which would have been suggested by the teaching of EP '220) and a PTFE binder (page 5, line 25 through page 6, line 4 as applied to claim 23).

With respect to claim 25:

EP '220 discloses providing a significant majority of the mixture to the active material alloy having minor constituents of the amorphous carbon and binder (page 5, ll. 35-56). The specification fails to set forth any criticality to the claimed ranges nor does it show unexpected results for such. Thus selecting particular amounts of the hydrogen storage alloy, conductive carbon and binder is a matter of optimizing the electrical and mechanical characteristics of the cell. Increasing the binder amount will increase the adhesion of the electrode material while conversely reducing the amount of active material and/or electrical conductive carbon material. Increasing the amount of active material relative to the carbon material and/or binder material will increase the capacity of the electrode at the expense of reducing the adhesion in the electrode (less binder) and/or decrease the electrical conductance between the current collector and conductive carbon. Increasing the amount of the conductive carbon relative to the active material and/or binder material will increase the electrical conductivity between the active material and the current collector of the electrode at the expense of reducing the adhesion in the electrode (less binder) and/or decreasing the active material and capacity of the electrode.

Thus in short, one of ordinary skill in the art would have found selection of particular weight ratios of the active material, conductive carbon material and binder material to have been a matter of optimization, the results of such optimization providing obvious results relative to the capacity of the electrode, electrical conductivity between

Art Unit: 1745

the electrode active material and current collector and binding strength in the electrode active material/conductive carbon material/ binder material mixture. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesche, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

With respect to the method of obtaining the active compound and particularly to the limitations drawn to the liquid fraction or a relationship between the mass ratio of the liquid fraction and dry fraction (claims 23, 26, 28 and 29:

The claims are drawn to a product-by-process. In product-by-process claims, it is reasonable not to give weight to the process limitations when there is no clear evidence to unexpected results or criticality of the process being the only process to obtain the claimed product.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of

Art Unit: 1745

prima facie obviousness for product-by-process claims because of their peculiar nature” than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

Thus the limitations to the liquid fraction have not been accorded weight since they are aspects of the process of obtaining the active material of claim 23 and are not positively present in the final active material product (as applied to claims 23-29 and particularly to the limitations expressed in claims 23, 26, 28 and 29).

13. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over van Ommering EP '220 as applied to claims 14 and 23 above, and further in view of JP 06-168719-A (JP '719).

The difference not yet discussed is of the dry fraction comprising particles of the storage alloy covered with PTFE fibrils.

JP '719 discloses providing a mixture of the hydrogen storage alloy and PTFE fibers (fibrils) on the surface of the current collector. The mixture of the coating will have both PTFE and the alloy coating one another.

Art Unit: 1745

The motivation for this arrangement is that it prevents the exfoliation of the hydrogen occlusion alloy coating from the substrate.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of van Ommering by providing a mixture of the hydrogen storage alloy and PTFE fibers (fibrils) on the surface of the current collector since it would have provided a coating which prevented the exfoliation of the hydrogen occlusion alloy from the substrate.

#### ***Allowable Subject Matter***

14. Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record appears to teach, fairly suggest or render obvious the invention of claim 17. In particular of every second negative electrode being split in two parts.

van Ommering teaches of all negative electrodes except for the end negative electrodes being split and there is insufficient teaching or suggestion in van Ommering or the remaining prior art of record to provide the split arrangement of claim 17.

#### ***Conclusion***

Art Unit: 1745

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (571) 272-1283. The examiner can normally be reached on Monday to Thursday from 9 a.m. to 6 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. FAXES received after 4 p.m. will not be processed until the following business day. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status



Art Unit: 1745

information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregg Cantelmo  
Primary Examiner  
Art Unit 1745

gc

A handwritten signature in black ink, appearing to read "Gregg Cantelmo", with a long horizontal stroke extending to the right.

September 28, 2004